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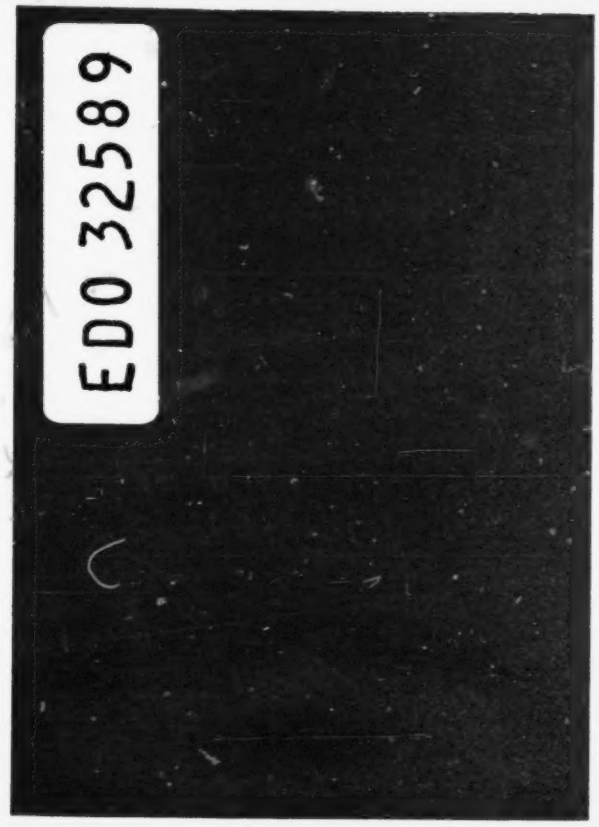

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Factor Analytic Scales of a Normative Form of the EPPS[1]

Richard C. Sherman and Charles A. Poe

The Edwards Personal Preference Schedule (EPPS) was developed as a measure of 15 of the 40 personal needs proposed by Murray (1938). Edwards (1959), in seeking to control for the social desirability of response set, arranged the items of the test into pairs matched in terms of their social desirability ratings. The resultant scores on this instrument are ipsative, i.e., the 15 need scores must sum to a certain fixed constant, and therefore the magnitude of any one need score is effected by the magnitudes of other need scores, as a function of the measuring instrument per se, irrespective of the traits being measured. This artifactual relationship between need scores produces somewhat spurious correlations between the 15 needs and prevents accurate assessment of the independence or dependence of the needs represented on the EPPS. At present there is little clear evidence bearing on the question of how the 15 needs measured by the EPPS relate to one another.

The present study was designed to answer this question by applying the method of factor analysis to items from the EPPS when they were presented in a normative, or "free-choice" fashion. Specifically, the study had three aims: (1) to ascertain the factor structure of a normative form of the EPPS, (2) to construct, if possible, new scales which would reflect this structure and meet the requirements of factor purity and reliability, and (3) to observe the relationships of the new scales

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with additional ability and personality data which would be predicted from scale content.

Method

The 135 distinct items from the EPPS[2] were arranged in a 5-choice Likert format and presented to 31[illegible] college freshmen (196 males, 146 females) enrolled in an introductory psychology course during the academic year 1966-67. Subjects were instructed to indicate on the scale the extent to which they felt each statement was "true of them." Responses to the items were correlated and the inter-item matrix was then subjected to a principle-axes factor analysis using unities in the diagonals. A convergence criterion of .0001 was used in the analysis. By examining the eigenvalues of each of the factors and the relative amount of variance accounted for by each factor, it was concluded that four primary dimensions were contained in the matrix. Since the principle-axes method yields orthogonal factors by design, and since the factors seemed clearly interpretable as extracted, it was decided not to rotate them.

Factor scales were then constructed by successively selecting items with the highest loadings on any one factor and then exluding those items from consideration for other scales. For each scale an attempt was made to set the factor-loading criterion at an optimum level such that enough items would be included to adequately sample the scale-relevant behavior

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and to maintain an acceptable level of reliability.

Correlations were then computed between each of the four scales and measures of academic ability: 1st year grade point average (GPA), high school rank (HSR), Minnesota Scholastic Aptitude Test scores (MSAT), and English and math placement test scores (Eng. Pl., Math Pl.). Correlations were also computed between the four scales and measures of personality: the number of adjectives checked, the Counseling Readiness, Deference, Self-Confidence, Self-Control, Lability, and Personal Adjustment scales of Gough's (1965) Adjective Check List (ACL), Rotter's (1966) Internal-External Scale (I-E), and Risk-taking Orientation scores.

Results

The four new factor-analytic scales (named by examining their item content), the number of items in each, and the internal consistency reliability estimates are as follows: (I) Interpersonal Orientation, N=16, r=.92; (II) Assertive Agressiveness, N=18, r=.84; (III) Persistent Dependency, N=25, r=.83; (IV) Doing-Thinking, N=30, r=.83. The average correlation between the scales was .04, with a range from -.13 to +.27. To briefly indicate the content of the new factor scales, the frequency of items from the original EPPS scales is indicated in the Appendix.[3]

The correlations between each of the four scales and measures of academic ability and personality are presented in Table 1. Twenty of the 38 predicted correlations were significant and in the directions predicted. Four of the 38 were significant but opposite the predicted directions. The remaining 14 correlations did not reach significance.

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[3]Also in the Appendix is a listing of the item numbers found in the EPPS booklet. Thus, the interested reader may look up the items for each factor scale.

The t-tests of the differences between males and females on each of the scales were found to be significant and in the predicted directions, as indicated in Table 2. Males were lower than females on Scale I (Interpersonal Orientation) and higher than females on Scales II (Assertive Agressiveness), III (Persistent Dependence), and IV (Doing-Thinking).

Discussion

The most notable implication of these results is that the 15 scales represented in a normative form of the EPPS appear to be best accounted for by four primary and independent dimensions. That is, if 15 needs are present in the normative EPPS, the present evidence suggests that they are not independent, but rather correlated needs, and that they may be more parsimoniously accounted for by a more limited number of factors. Further, the four scales developed in this study appear to reflect more accurately the underlying structure among items presented in this normative, or "free-choice," fashion. Finally, the relatively high levels of the internal consistency reliability estimates for each of the four factor-analytic scales is encouraging for this type of measurement.

An examination of the correlations between each of the four scales and the measures of academic ability and personality presented in Table 1 indicates that the variables measured by these scales relate meaningfully to other variables. The correlation values, though not high, seem to be significant enough to warrant further investigation. The tentative implication here is that knowledge of an individual's scores on the four factor-analytic scales constructed in this study also gives one some

knowledge of such variables as objective academic performance, deference, self-confidence, self-control, personal adjustment, and risk-taking orientation. Further, the sex differences on each of the four scales were significant and in the predicted directions, also demonstration some predictive power of the new scales. If these scales are found to cross-validate across samples and to demonstrate stability as well as internal consistency, then it appears that they may have some usefulness in personality assessment and counseling.

The question may be raised as to the problem of social desirability of response-set in both the normative form of the EPPS and the factor-analytic scales constructed from free-choice items. It was noted above that the method of arranging items in matched pairs was proposed by Edwards (1959) to alleviate the problem which he thought existed in free-choice or rating-scale procedures. There is evidence, however, (Anastasi, 1961), that the Edwards procedure does not control for social desirability to the extent previously thought, and that under most circumstances both the force-choice and free-choice methods are subject to this response-set about equally, Also, Poe (1968) compared needs measured ipsatively and normatively in the same subjects and found evidence for an acceptable level of agreement (median correlation between the same needs measured both ways was .67, with a range from .46 to .75). Finally, it can be argued that "social desirability" is useful information concerning the personality of an individual, and that it is perhaps best not to attempt to exclude it from personality measures. What is most important is how test-taking behavior, regardless of the influence of social desirability response-set, is related to other behaviors.

A final word of caution should be added concerning the use of the four scales constructed in the present study. As in the construction of any measuring instrument, cross-validation with a new sample is necessary before confidence can be placed in the scores obtained with the instrument. The present authors (Sherman and Poe, 1969) have collected some evidence as to the validity of these scales across samples, and the preliminary results suggest that Scales III and IV are not as consistent across samples as Scales I and II. In light of these results, and with respect to standard test-construction procedures, it is most prudent to present these scales as research instruments only, and to reserve their practical applications for the time when more evidence as to their stability and validity is available.

Summary

The 135 distinct items from the EPPS were arranged in a 5-choice Likert Format and presented to 315 subjects. Factor scales were constructed and correlated with other measures of personality and academic ability. Differences between males and females were tested for significance. The results suggest that reliable and meaningful measurement of each of the four underlying dimensions in the normative form of the EPPS is possible with the four factor-analytic scales developed in this investigation.

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Table 1

Predicted Correlations Between the Four Factor Scales and Measures for Academic Ability and Personality

	I Interpersonal Or.	II Assertive-Aggress.	III Persist.-Depend.	IV Doing-Thinking
GPA	-10 * P	11 * NP	12 ** P	-02 NP
HSR	01	16**** P	-02 NP	00 NP
MSAT	-06 NP	05	01 NP	13*** P
ENG. PL.	00 NP	-08	04 NP	09 NP
MATH	-22**** P	11 *	12 ** P	-05 NP
#ADJ. CHECKED	19****	23**** P	-03	16**** P
Couns. Read.	-12 ** NP	02	00	-12 ** NP
DEF.	01	14 ** P	32**** P	-09
SELF. CONF.	-10 *	21**** P	22**** P	08
SELF. CONTR.	09	-42**** P	27**** P	-19****
LAB.	03	13 *	-18**** P	16**** P
PERS. ADJ.	11 *	-29**** P	22**** P	-04
I - E	11 NP	11 NP	-34****NP	07 NP
RISK.	22 *** P	-31 ***. P	-09 NP	-12 NP

Notes: P=supports prediction; NP = does not support prediction; cells without P or NP indicates that no prediction was made. Data from the 1st twelve variables were collected from 315 subjects, for the last two variables 124 subjects *p<.05; ** p<.025; *** p<.01; **** p<.005

Table 2

Mean Scale Scores and Differences Between Males and Females

	Males N=169	Females N=146	t	P
I (Interpersonal Orientation)	59.43	65.88	5.45	<.005
II (Assertive Aggressiveness)	54.86	49.64	5.02	<.005
III (Persistent Dependence)	82.41	79.19	3.04	<.005
IV (Doing-Thinking)	99.61	94.83	4.55	<.005

APPENDIX

New factor-analytic scales

I Interpersonal Orientation	II Assertive Aggressiveness	III Persistent Dependence	IV Doing-Thinking
Frequency of items from origianl EPPS scales			
Nurturance 5	Aggression 5	Endurance 7	Intraception 9
Affiliation 4	Exhibition 4	Succorance(-) 5	Change 5
Deference 3	Autonomy 3	Order 3	Order(-) 5
Succorance 3	Heterosexuality 3	Dominance 2	Deference(-) 2
Endurance 1	Dominance 2	Autonomy 2	Affiliation 2
Total 16	Deference(-) 1	Affiliation(-) 2	Aggression(-) 1
	Total 18	Deference 1	Abasement(-) 1
		Achievement 1	Achievement(-) 1
		Nurturance(-) 1	Endurance(-) 1
		Aggression 1	Heterosexuality(-) 1
		Total 25	Nurturance 1
			Autonomy 1
			Total 30
Item numbers as found in EPPS booklet			
37-B, 136-B, 32-A, 76-A, 54-B, 121-A, 83-A, 53-B, 81-A, 37-A, 127-B, 51-B, 62-A, 128-B, 111-B, 30-B	147-B, 97-B, 27-A, 143-B, 4-A, 19-B, 64-A, 70-B, 117-A, 20-A, 24-A, 74-B, 149-B, 118-B, 150-B, 55-A, 72-B, 69-B	63-B, 143-A, 104-A, 23-A, 2-A, 15-A, 36-B, 1-B, 138-B, 140-B, 62-B, 126-B, 96-A, 163-A, 11-B, 65-B, 61-B, 39-B, 13-B, 89-A, 27-B, 148-B, 40-B, 25-B, 38-B	59-A, 31-B, 75-B, 60-A, 29-B, 32-B, 122-B, 102-A, 12-B, 109-B, 53-A, 110-B, 133-B, 17-A, 16-A, 92-A, 52-B, 60-B, 137-B, 3-A, 33-B, 34-B, 35-B, 10-A, 26-B, 42-A, 134-B, 33-A, 8-A, 66-B

Note: (-) indicates a negative loading.